

FACT SHEET FOR NPDES PERMIT WA-002249-7
CITY OF MARYSVILLE

TABLE OF CONTENTS

| | |
|--|----|
| INTRODUCTION | 4 |
| BACKGROUND INFORMATION | 5 |
| DESCRIPTION OF THE FACILITY | 5 |
| History..... | 5 |
| Collection System Status | 5 |
| Treatment Processes..... | 5 |
| Discharge Outfall | 5 |
| Residual Solids..... | 5 |
| PERMIT STATUS..... | 6 |
| SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT | 6 |
| WASTEWATER CHARACTERIZATION | 6 |
| PROPOSED PERMIT LIMITATIONS..... | 7 |
| DESIGN CRITERIA | 7 |
| TECHNOLOGY-BASED EFFLUENT LIMITATIONS | 8 |
| SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS | 9 |
| Numerical Criteria for the Protection of Aquatic Life..... | 9 |
| Numerical Criteria for the Protection of Human Health..... | 9 |
| Narrative Criteria | 9 |
| Antidegradation..... | 9 |
| Critical Conditions | 10 |
| Mixing Zones | 10 |
| Description of the Receiving Water..... | 10 |
| Surface Water Quality Criteria | 11 |
| Consideration of Surface Water Quality-based Limits for Numeric Criteria | 12 |
| Whole Effluent Toxicity | 15 |
| Human Health | 16 |
| Sediment Quality | 17 |
| GROUND WATER QUALITY LIMITATIONS..... | 17 |
| COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED APRIL 7, 2000 | 17 |
| MONITORING REQUIREMENTS | 19 |
| LAB ACCREDITATION | 19 |
| OTHER PERMIT CONDITIONS | 19 |
| REPORTING AND RECORDKEEPING | 19 |
| PREVENTION OF FACILITY OVERLOADING | 19 |
| OPERATION AND MAINTENANCE (O&M)..... | 19 |
| RESIDUAL SOLIDS HANDLING..... | 20 |
| PRETREATMENT | 20 |
| Federal and State Pretreatment Program Requirements | 20 |
| Wastewater Permit Required | 21 |
| Requirements for Routine Identification and Reporting of Industrial Users | 21 |

| | |
|--|----|
| Requirements for Performing an Industrial User Survey | 21 |
| Duty to Enforce Discharge Prohibitions | 21 |
| Support by the Department for Developing Partial Pretreatment Program by POTW | 22 |
| OUTFALL EVALUATION | 22 |
| GENERAL CONDITIONS | 22 |
| PERMIT ISSUANCE PROCEDURES | 22 |
| PERMIT MODIFICATIONS | 22 |
| RECOMMENDATION FOR PERMIT ISSUANCE | 22 |
| REFERENCES FOR TEXT AND APPENDICES..... | 23 |
| APPENDIX A--PUBLIC INVOLVEMENT INFORMATION..... | 24 |
| APPENDIX B--GLOSSARY | 25 |
| APPENDIX C--TECHNICAL CALCULATIONS | 30 |
| APPENDIX D--RESPONSE TO COMMENTS | 35 |

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the Wastewater Discharge Permit Program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of waste water to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. Comments and the resultant changes to the permit will be summarized in [Appendix D--Response to Comments](#).

| GENERAL INFORMATION | |
|---------------------------|--|
| Applicant | City of Marysville |
| Facility Name and Address | Marysville Wastewater Treatment Plant 2 Columbia Avenue, Marysville, WA 98270 |
| Type of Treatment | Aerated lagoon with filtration |
| Discharge Location | Steamboat Slough (Outfall 001) Latitude: 48° 02' 08" N Longitude: 122° 10' 20" W Port Gardner Bay (Outfall 100) Latitude: 47° 58' 10" N Longitude: 122° 14' 48" W |
| Water Body ID Number | WA-07-1005 WA-PS-0030 |

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The City of Marysville, incorporated in 1891, is located in Snohomish County, 5 miles north of the City of Everett. Neighboring communities include the Tulalip Indian Reservation, the City of Arlington, and the City of Lake Stevens. The wastewater treatment plant, located south of the city on Ebey Slough, was constructed in 1959 and modified in 1980 and 1992. The facility currently serves a population of about 28,000. About 20 percent of connections are commercial or industrial; the rest are residential. The three major industrial customers are National Foods, Pacific Feather, and Quilceda Tannery.

COLLECTION SYSTEM STATUS

The collection system includes approximately 125 miles of pipe, ranging in diameter from 6 to 48 inches. Pipe materials include asbestos cement, concrete, and polyvinyl chloride (PVC). There are eight pump stations.

TREATMENT PROCESSES

The treatment process includes 3 screw-type influent pumps, mechanical bar screens, six aerated lagoons and four oxidation ponds, effluent filters, ultraviolet disinfection, a sodium hypochlorite backup disinfection system, and effluent pumping.

DISCHARGE OUTFALL

Marysville has an effluent transfer system which allows it to discharge secondary treated and disinfected effluent to Steamboat Slough or to the city of Everett for discharge into Port Gardner Bay.

The Steamboat Slough outfall is a 28-inch diameter pipe terminating in a diffuser with seven risers. Each riser terminates in two ports. At mean lower low water, the depth of the diffuser nozzles is 12.5 feet. During the low flow season (July through October), this outfall will not be used for regular effluent discharge.

Effluent may also be pumped into the city of Everett's effluent system and discharged into the new Kimberly-Clark/Everett outfall in Port Gardner Bay. This is a 54-inch pipeline that discharges at a depth of approximately 350 feet.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the waste water at the headworks (grit and screenings), in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local landfill.

PERMIT STATUS

The previous permit for this facility was issued on April 7, 2000. The previous permit placed effluent limitations on 5-day Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, Total Ammonia, and Total Residual Chlorine.

An application for permit renewal was submitted to the Department on December 30, 2003, and accepted by the Department on February 20, 2004.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on February 5, 2002 (compliance inspection with sampling).

Since June 2000, the Permittee has violated permit limits for CBOD₅ (4 months), fecal coliform (9 months), ammonia nitrogen (8 months), suspended solids percent removal (1 month), and total suspended solids (1 month), based on monthly Discharge Monitoring Reports (DMRs) submitted to the Department.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in Discharge Monitoring Reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

| Parameter | Average Concentration |
|------------------------------|--|
| CBOD ₅ | 18 mg/L |
| Chlorine | 39 µg/L |
| Fecal Coliform | 17/100 mL |
| Ammonia Nitrogen | 27 mg/L |
| Total Suspended Solids | 22 mg/L (filtered); 54 mg/L (unfiltered) |
| Total Dissolved Solids | 271 (mg/L) |
| Hardness | 60 (mg/L) |
| Arsenic | 1.75 (µg/L) |
| Copper | 4.23 (µg/L) |
| Lead | 0.50 (µg/L) |
| Silver | 0.18 (µg/L) |
| Zinc | 19.5 (µg/L) |
| Nitrate | 1.17 (mg/L) |
| Nitrite | 1.03 (mg/L) |
| Total Phosphorus | 3.80 (mg/L) |
| TKN | 34.1 (mg/L) |
| Acetone | 3.33 (µg/L) |
| bis (2-Ethylhexyl) phthalate | 15.9 (µg/L) |
| Di-n-Octyl phthalate | 4.33 (µg/L) |

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the *City of Marysville Wastewater Treatment Plant Upgrade and Expansion – Phase II Drawings*, dated May 2003, prepared by Tetra Tech/KCM, Inc. and are as follows:

Table 2: Influent Flow and Loading Design Standards for City of Marysville WWTP.

| Parameter | Design Quantity |
|--|-----------------|
| Flow - Average Annual | 10.1 MGD |
| Flow - Maximum Month | 12.7 MGD |
| Flow - Maximum Day | 15.6 MGD |
| Flow - Peak Hour | 20.3 MGD |
| BOD ₅ influent loading – Average Annual | 17,070 lbs/day |
| BOD ₅ influent loading – Maximum Month | 20,143 lbs/day |
| BOD ₅ influent loading – Maximum Day | 24,922 lbs/day |
| TSS influent loading – Average Annual | 17,815 lbs/day |
| TSS influent loading – Maximum Month | 24,229 lbs/day |
| TSS influent loading – Maximum Day | 38,125 lbs/day |

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal waste water.

The applicable technology-based limits from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

| Parameter | Limit |
|--------------------------------------|--|
| pH | shall be within the range of 6 to 9 standard units. |
| Fecal Coliform Bacteria | Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL |
| CBOD ₅ (concentration) | Average Monthly Limit is the most stringent of the following: - 25 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 40 mg/L |
| TSS (concentration) | Average Monthly Limit is the most stringent of the following: - 30 mg/L Average Weekly Limit = 45 mg/L |

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent CBOD₅ mass loading (lbs/day) is calculated as the maximum monthly design flow (12.7 MGD) x concentration limit (25 mg/L) x 8.34 (conversion factor) = CBOD₅ mass limit of 2,650 lbs/day.

Weekly effluent CBOD₅ mass loading (lbs/day) is calculated as the maximum monthly design flow (12.7 MGD) x concentration limit (40 mg/L) x 8.34 (conversion factor) = CBOD₅ mass limit of 4,240 lbs/day.

Monthly effluent TSS mass loading (lbs/day) is calculated as the maximum monthly design flow (12.7 MGD) x concentration limit (30 mg/L) x 8.34 (conversion factor) = TSS mass limit of 3,180 lbs/day.

Weekly effluent TSS mass loading (lbs/day) is calculated as the maximum monthly design flow (12.7 MGD) x concentration limit (45 mg/L) x 8.34 (conversion factor) = TSS mass limit of 4,770 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the waste water and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other diseases and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

A water quality modeling study of the Snohomish River Estuary system from Possession Sound to river mile 20 was conducted using the WASP5 model to simulate hydrodynamics and water quality. The WASP5 model was developed to assess the capacity of the estuary system to assimilate oxygen consuming pollutants from point and nonpoint sources. The model was calibrated using data collected in August and September 1993 and confirmed (verified) using data collected in August 1996. The water quality model predicted that natural conditions in a large portion of the estuary would be below dissolved oxygen standards under critical conditions. The model also predicted that point sources of oxygen-consuming pollutants would cause an exceedence of the 0.2 mg/L deficit allowed by the marine criteria when natural conditions are below the standard. The model was used to recommend waste load allocations (WLAs) for the existing point sources of carbonaceous biochemical oxygen demand (CBOD) and ammonia BOD, including the City of Marysville treatment plant, the City of Everett treatment plant, the Lake Stevens Sewer District treatment plant, and the City of Snohomish treatment plant. The allocations are incorporated as permit limits in this permit in order to protect existing water quality.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic waterbody uses.

MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Steamboat Slough in the Snohomish River Estuary, which is designated as a Class A marine receiving water in the vicinity of the outfall. The facility will also discharge to Port Gardner Bay through the City of Everett's and Kimberly-Clark's shared outfall line. Port Gardner Bay is also designated as Class A marine water. Other nearby point source outfalls include the City of Everett, Lake Stevens Sewer District, the City of Snohomish, Kimberly-Clark, and the Tulalip Tribes wastewater treatment plant. Significant nearby non-point sources of pollutants include several diking district discharges, and the urban areas of Marysville and Everett. Characteristic uses include the following:

- fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA, 1992).

The Steamboat Slough outfall is located within an estuary boundary defined by a salinity of one part per thousand (‰) at Mean Higher High Water and at an average annual low flow of 6,577 cubic feet per second. The Class A marine water criteria will apply for dissolved oxygen and aquatic life where the Snohomish River TMDL model predicts salinity of 1‰ or greater. For the Environmental Protection Agency's National Toxics Rule, freshwater criteria will be applied to waters with salinity less than 1‰; saltwater criteria will be applied in waters with salinity greater than 10 ‰; and the more stringent criteria will be applied in waters between 1 and 10 ‰. Port Gardner Bay is classified as Class A marine water.

Criteria for these waters are summarized below:

Steamboat Slough/Snohomish River:

| | |
|------------------|--|
| Fecal Coliforms | 200 organisms/100 mL maximum geometric mean [WAC 173-201A-130(99)], Specific classification – Freshwater |
| Dissolved Oxygen | Marine water – shall exceed 6.0 mg/L. When natural conditions, such as upwelling, occur causing the dissolved oxygen to be depressed near or below 6.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities. |
| Temperature | Marine water – shall not exceed 16.0° C due to human activities. When natural conditions exceed 16.0° C, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3° C. |
| pH | Marine water – 7.0 to 8.5 standard units with a human-caused variation within the above range of less than 0.5 units. |
| Turbidity | Shall not exceed 5 NTU over background turbidity when the background is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background is more than 50 NTU. |
| Toxics | No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge) |

Port Gardner Bay:

| | |
|------------------|---|
| Fecal Coliforms | 14 organisms/100 mL maximum geometric mean |
| Dissolved Oxygen | Shall exceed 6.0 mg/L. When natural conditions, such as upwelling, occur causing the dissolved oxygen to be depressed near or below 6.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities. |

| | |
|-------------|---|
| Temperature | Shall not exceed 16.0° C due to human activities. When natural conditions exceed 16.0° C, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3° C. |
| pH | 7.0 to 8.5 standard units with a human-caused variation within the above range of less than 0.5 units. |
| Turbidity | Shall not exceed 5 NTU over background turbidity when the background is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background is more than 50 NTU. |
| Toxics | No toxics in toxic amounts for numeric criteria for toxics of concern for this discharge |

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. Mixing zones are authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

Steamboat Slough (Outfall 001)

Dilution modeling for the Steamboat Slough outfall was conducted at the time of its construction (Jones and Stokes, 1996) using the PLUMES model. The modeling was updated by Cosmopolitan Engineering Group and included as Appendix M to the *Wastewater Treatment Plant Capital Facilities Plan* (Tetra Tech/KCM, Inc., 2001). An additional study of dilution during the months of November through June was conducted during 2002 (*Technical Memorandum – City of Marysville – Dilution Modeling and Reasonable Potential for Months Not Regulated By the Snohomish Estuary TMDL*, Cosmopolitan Engineering Group, January 2003). The dilution factors used in this permit apply to a maximum discharge of 8.3 MGD during the months of November through June. They are as follows:

| | Acute | Chronic |
|------------------------------|-------|---------|
| Aquatic Life | 10.9 | 27.1 |
| Human Health, Carcinogen | | 27.1 |
| Human Health, Non-carcinogen | | 27.1 |

The critical condition for Steamboat Slough during the months of November through June occurs when the Snohomish River is at the seven-day average low river flow with a recurrence interval of twenty years (7Q20). Ambient data at critical conditions in the vicinity of the Marysville outfall are published in the *City of Marysville Amended Outfall Mixing Study* (Jones and Stokes, 1996).

Port Gardner Bay (Outfall 100)

A study of effluent mixing at the Port Gardner Bay outfall (combined Kimberly-Clark, City of Everett, and City of Marysville effluent) was conducted according to the requirements of Kimberly-Clark's NPDES permit (*Effluent Mixing Study – Outfall 100*, CH2MHill, September 3, 2004). Critical receiving water conditions are maximum water column stratification and critical current speeds. The minimum dilution factors have been determined to be:

| | Acute | Chronic |
|------------------------------|-------|---------|
| Aquatic Life | 156 | 696 |
| Human Health, Carcinogen | | 696 |
| Human Health, Non-carcinogen | | 696 |

Dissolved Oxygen--The impact of CBOD and ammonia on the Snohomish River and Steamboat Slough was modeled using the WASP5 model at critical conditions and with the technology-based effluent limitation for CBOD₅ described under "Technology-Based Effluent Limitations" above. The calculations used to determine dissolved oxygen impacts are shown in the Snohomish River Estuary Dry Season TMDL Study – Phase II (Ecology Publication No. 97-325). Under critical conditions with technology-based effluent limits there was a prediction of a violation of the dissolved oxygen criterion for the receiving water. A CBOD₅ effluent limit of 672 lbs/day daily maximum along with an effluent limit for ammonia of 403 lbs/day daily maximum were found to be protective of the dissolved oxygen criterion and therefore was imposed instead of the technology-based limitation. Monthly average limits were calculated using methods from EPA, 1991. These limits apply only during the low river flow season, July through October, when the Steamboat Slough outfall will not be used except for maintenance-related discharges.

The discharge into Port Gardner Bay (Outfall 100) with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in this receiving water.

Temperature--Under critical conditions, there is no predicted violation of the water quality standards for surface waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the water quality standards for surface waters.

Fecal Coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 5.5.

Under critical conditions, there is no predicted violation of the water quality standards for surface waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: ammonia, arsenic, copper, lead, silver, and zinc. A reasonable potential analysis (see Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for ammonia, arsenic, copper, lead, silver, and zinc to exceed the water quality criteria in Steamboat Slough was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition.

Valid ambient background data was available for ammonia, arsenic, copper, lead, silver, and zinc. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards for arsenic, copper, lead, silver, and zinc. This determination assumes that the Permittee meets the other effluent limits of this permit.

Effluent limits were derived for ammonia, which was determined to have a reasonable potential to cause a violation of the water quality standards. Effluent limits were calculated using methods from EPA, 1991 as shown in Appendix C.

The resultant effluent limits for the discharge to Steamboat Slough (Outfall 001) are as follows:

Ammonia: 22.9 mg/L monthly average, 44.4 mg/L daily maximum

Because of the high dilution of the discharge to Port Gardner Bay (Outfall 100) there is no reasonable potential for this discharge to cause a violation of water quality standards.

WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their waste water with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center at (360) 407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize the chronic toxicity of the effluent.

If chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

Acute toxicity was measured during effluent characterization in the previous permit term. Acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. The acute toxicity limit is no statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 9.2% of the effluent, and the control.

The acute toxicity limit is set relative to the zone of acute criteria exceedance (acute mixing zone) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on knowledge of data or process information indicating regulated chemicals occur in the discharge.

Three effluent sample results were submitted in the permit application for the following pollutant:

bis (2-Ethylhexyl) phthalate - 0 µg/L, 9.8 µg/L, 38 µg/L

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) and the Department's *Permit Writer's Manual* (Ecology Publication 92-109, July 1994). There is no reasonable potential for violation of the water quality standards. The discharger will be required in this permit to submit additional data before the next permit reissuance.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the sediment management standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED APRIL 7, 2000

| Parameter | Existing Limits | Proposed Limits |
|---|--|----------------------|
| Carbonaceous Biochemical Oxygen Demand (5-day) | | |
| 001 (July-Oct.) | | |
| Monthly Average | 25 mg/L; 374 lbs/day | 25 mg/L; 419 lbs/day |
| Weekly Average | 40 mg/L | 40 mg/L |
| Daily Maximum | 672 lbs/day | 672 lbs/day |
| 001 (Nov.-June) | | |
| Monthly Average | 25 mg/L; 1,272 lbs/day | 25 mg/L |
| Weekly Average | 40 mg/L; 2,035 lbs/day | 40 mg/L |
| 100 (all year) | | |
| Monthly Average | | 25 mg/L |
| Weekly Average | | 40 mg/L |
| 001 + 100 (all year) | | |
| Monthly Average | | 2,650 lbs/day |
| Weekly Average | | 4,240 lbs/day |
| Total Suspended Solids | | |
| 001 | | |
| Monthly average | 75 mg/L; 1,751 lbs/day | 30 mg/L |
| Weekly average | 110 mg/L; 2,569 lbs/day (for the portion of the flow less than or equal to 2.8 MGD) | 45 mg/L |
| Monthly average | 30 mg/L; 308 lbs/day | |
| Weekly average | 45 mg/L; 462 lbs/day (for the portion of flow greater than 2.8 MGD) | |

| Parameter | Existing Limits | Proposed Limits |
|---|---|--|
| 100 Monthly average Weekly average | | 30 mg/L 45 mg/L |
| 001 + 100 Monthly average Weekly average | | 3,180 lbs/day 4,770 lbs/day |
| Fecal Coliform Bacteria | | |
| 001 Monthly average Weekly average | 200 per 100 mL 400 per 100 mL | 200 per 100 mL 400 per 100 mL |
| 100 Monthly average Weekly average | | 200 per 100 mL 400 per 100 mL |
| pH | | |
| 001 | Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9. | Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9. |
| 100 | | Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9. |
| Total Ammonia | | |
| 001 (July-Oct.) Monthly average Daily maximum | 101 lbs/day 403 lbs/day | 101 lbs/day 403 lbs/day |
| 001 (Nov.-June) Monthly average Daily maximum | | 22.9 mg/L 44.4 mg/L |
| Total Residual Chlorine | | |
| 001 (July-Oct.) Monthly average Daily maximum | 44 µg/L; 1.5 lbs/day 114 µg/L | None; no use of chlorine |
| 001 (Nov.-June) Monthly average Daily maximum | 54 µg/L; 2.7 lbs/day 135 µg/L | None; no use of chlorine |
| Acute Toxicity | | |
| 001 | | The effluent limit for acute toxicity is no acute toxicity detected in a test concentration representing the acute critical effluent concentration (ACEC). |

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for an aerated lagoon.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, Accreditation of Environmental Laboratories. The laboratory at this facility is accredited for General Chemistry and Microbiology.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Snohomish County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, Part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)) (Industries discharging waste water that is similar in character to domestic waste water are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty (60) days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a Wastewater Discharge Permit from the Department. None of the obligations imposed on

the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a Wastewater Discharge Permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State Waste Discharge Permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State Waste Discharge Permit application.

Requirements for Performing an Industrial User Survey

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of State Waste Discharge Permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in the Department of Ecology guidance document entitled "Conducting an Industrial User Survey."

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass-through or interference. The definitions of pass-through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular, assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit Condition S.11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet water quality standards, sediment quality standards, or ground water standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109.

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on March 1, 2004, and March 8, 2004, in *The Everett Herald* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on May 27, 2005, in *The Everett Herald* to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

Washington State Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008-5452
Attention: Permit Coordinator

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone at (425) 649-7201 or by writing to the address listed above.

This permit and fact sheet were written by Laura Fricke.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART--An acronym for "all known, available, and reasonable methods of prevention, control, and treatment."

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in waste water. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect waste water.

Average Monthly Discharge Limitation--The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation--The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural, and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅--The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR, Part 136.

Chlorine--Chlorine is used to disinfect waste waters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous Monitoring--Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction, e.g. a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the waste water. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated waste water and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial User--A discharger of waste water to the sanitary sewer which is not sanitary waste water or is not equivalent to sanitary waste water in character.

Industrial Waste Water--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic waste water. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference--A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of >80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of <80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

Pass-through--A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of state water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A Potential Significant Industrial User is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges waste water meeting one or more of the following criteria:

- a. Exceeds 0.5% of treatment plant design capacity criteria and discharges <25,000 gallons per day; or
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass-through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)--A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1. All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
2. Any other industrial user that: discharges an average of 25,000 gallons per day or more of process waste water to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down waste water); contributes a process waste stream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at (<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>).

NPDES Permit No.

REASONABLE POTENTIAL CALCULATION

| This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB) | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|---------|------------------------------|------------------------------|--------------------------|---------|---------------------------------|--------------|---------------------------|-------|--|--------------------|------|----------------|------------|-------------------|---------------------|--------------------------------|---------|
| Parameter | Metal Criteria | | | | Ambient Concentration (ug/L) | State Water Quality Standard | | | Max concentration at edge of... | LIMIT REQ'D? | Effluent percentile value | Pn | Max effluent conc. measured (metals as total recoverable) ug/L | Coeff Variation CV | s | # of samples n | Multiplier | Acute DI'n Factor | Chronic DI'n Factor | COMMENTS | |
| | Metal Criteria Translator as decimal | | Chronic | | | Acute | | Chronic | | | | | | | | | | | | | |
| | Acute | Chronic | Acute | Chronic | | Acute Mixing Zone ug/L | Chronic Mixing Zone ug/L | Acute | | | | | | | | | | | | | Chronic |
| Ammonia (Total as NH3-N) | | | | | 95.000 | 7381.00 | 1109.00 | 3086.28 | 1298.14 | YES | 0.95 | 0.966 | 32700.00 | 0.56 | 0.52 | 87 | 1.00 | 10.9 | 27.1 | For 50% of 2020 flow (8.3 MGD) | |
| Arsenic (dissolved) | 1.000 | | | | 2.000 | 69.00 | 36.00 | 2.77 | 2.31 | NO | 0.95 | 0.473 | 4.00 | 0.60 | 0.55 | 4 | 2.59 | 10.9 | 27.1 | Wet season only | |
| Copper | 0.830 | 0.830 | | | 2.000 | 4.80 | 3.10 | 3.19 | 2.48 | NO | 0.95 | 0.473 | 7.00 | 0.60 | 0.55 | 4 | 2.59 | 10.9 | 27.1 | | |
| Lead | 0.951 | 0.951 | | | 3.000 | 210.00 | 8.10 | 3.18 | 3.07 | NO | 0.95 | 0.473 | 2.00 | 0.60 | 0.55 | 4 | 2.59 | 10.9 | 27.1 | | |
| Silver | 0.850 | | | | | 1.90 | 100.00 | 0.08 | 0.04 | NO | 0.95 | 0.473 | 0.40 | 0.80 | 0.55 | 4 | 2.59 | 10.9 | 27.1 | | |
| Zinc | 0.946 | 0.946 | | | 19.000 | 90.00 | 81.00 | 26.68 | 22.09 | NO | 0.95 | 0.473 | 42.00 | 0.60 | 0.55 | 4 | 2.59 | 10.9 | 27.1 | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

5/20/2005 2:24 PM
Marysville tsdcalc11.xls

[illegible]

Calculation of monthly average limits

Equivalent monthly average limits were calculated according to the methods in EPA's Technical Support Document for Water Quality-Based Toxics Control.

Calculation of Low Flow TMDL Water Quality-Based Monthly Average Effluent Limits

| Ammonia | |
|-------------------------|---|
| 1. | The daily Waste Load Allocation (WLA) = Maximum Daily Limit = MDL = 403 lbs./day ammonia. |
| 2. | <p>Calculate the long-term average (LTA) which will comply with this wasteload allocation.</p> $MDL = LTA * e^{(Z\sigma - 0.5\sigma^2)}$ <p>where:</p> $\sigma^2 = \ln[CV^2 + 1] = .2643$ $z = 2.326 \text{ (99th percentile occurrence)}$ $CV = \text{coefficient of variation} = \text{std. dev.} / \text{mean} = 0.55$ <p>LTA = long-term average = 139 lbs./day ammonia</p> |
| 3. | <p>Calculate the monthly average effluent limit.</p> $AML = LTA * e^{(Z\sigma_n - 0.5\sigma_n^2)}$ <p>where:</p> $\sigma^2 = \ln[(CV^2/n) + 1] = .0249$ $n = \text{number of samples/month} = 12$ $z = 1.645 \text{ (95th percentile occurrence probability)}$ $CV = \text{coefficient of variation} = \text{std. dev.} / \text{mean} = 0.55$ <p>Average Monthly Limit = AML = 178 lbs./day ammonia</p> |
| CBOD₅ | |
| 1. | The Daily Waste Load Allocation (WLA) = Maximum Daily Limit = MDL = 672 lbs./day CBOD ₅ |
| 2. | <p>Calculate the long-term average (LTA) which will comply with this wasteload allocation.</p> $MDL = LTA * e^{(Z\sigma - 0.5\sigma^2)}$ <p>where:</p> $\sigma^2 = \ln[CV^2 + 1] = .0755$ $z = 2.326 \text{ (99th percentile occurrence)}$ $CV = \text{coefficient of variation} = \text{std. dev.} / \text{mean} = 0.28$ <p>LTA = long-term average = 368 lbs./day CBOD₅</p> |

3. Calculate the monthly average effluent limit.

$$AML = LTA * e^{(Z\sigma_n - 0.5\sigma_n^2)}$$

where:

$$\sigma^2 = \ln[(CV^2/n) + 1] = 0.006512$$

n = number of samples/month = 12

z = 1.645 (95th percentile occurrence probability)

CV = coefficient of variation = std. dev./mean = 0.28

Average Monthly Limit = AML = 419 lbs./day CBOD₅

APPENDIX D--RESPONSE TO COMMENTS

The City of Marysville submitted a letter commenting on the proposed permit. The City's comment is as follows:

"The Marysville NPDES permit should be changed for the high river flow period. Based on a reasonable potential analysis performed by Cosmopolitan Engineering Group (attached), during high river flow periods, below 6.6 mgd, ammonia shows no reasonable potential to exceed state water quality standards. Therefore, for the high river flow period, there should be no ammonia limit for effluent flow under 6.6 mgd.

This proposed change is consistent with the City's ability to split flows to Steamboat Slough and to Everett/Kimberly-Clark. With the proposed NPDES permit changes, during high river flow periods, the City will be able to discharge flows up to 6.6 mgd to Steamboat Slough, with all flows over 6.6 mgd to be sent to Everett/Kimberly-Clark."

Response:

The ammonia limits in the proposed permit are based on a discharge of 8.3 MGD to Steamboat Slough. The proposed permit limits also relied on ammonia data as interpreted by Cosmopolitan Engineering Group. For their analysis in the January 2003 *Technical Memorandum*, Cosmopolitan Engineering Group used data from Marysville's 2001 discharge monitoring reports. The analysis attached to Marysville's comment letter above does not specify which ammonia data were used.

I have re-done the reasonable potential calculations using the available dilution factors for a flow of 6.6 MGD and ammonia data from Marysville's effluent monitoring from January 2003 through May 2005. The low flow months of July through October were excluded as there will be no discharge to Steamboat Slough during these months. Using these 86 data points, the calculation shows no reasonable potential for violations of the water quality criteria for ammonia. The corresponding average monthly and maximum daily limits for ammonia would be 30.4 mg/l and 36.1 mg/l. There have been no ammonia levels recorded (during the 2003-2005 period) that would have violated these limits. Marysville's effluent has consistently been below 30 mg/l of ammonia since the beginning of 2003, with a very low coefficient of variation (CV).

Therefore, the ammonia limits have been removed from the proposed permit, and the flow to Steamboat Slough has been limited to 6.6 MGD during the months of November through June. Effluent testing for ammonia will be required at a reduced frequency (two times per month) in order to detect any increase in ammonia discharges.

REVISED REASONABLE POTENTIAL CALCULATION

| | | | | State Water Quality Standard | | Max concentration at edge of... | | |
|--------------------------|--------------------------------------|--------------------------------------|---|------------------------------|---------|---------------------------------|---------------------|--------------|
| | Metal Criteria Translator as decimal | Metal Criteria Translator as decimal | Ambient Concentration (metals as dissolved) | Acute | Chronic | Acute Mixing Zone | Chronic Mixing Zone | LIMIT REQ'D? |
| Parameter | Acute | Chronic | ug/L | ug/L | ug/L | ug/L | ug/L | |
| Ammonia (Total as NH3-N) | | | 95.000 | 7381.00 | 1109.00 | 2532.92 | 1035.68 | NO |
| Arsenic (dissolved) | 1.000 | | 2.000 | 69.00 | 36.00 | 2.70 | 2.27 | NO |
| Copper | 0.830 | 0.830 | 2.000 | 4.80 | 3.10 | 3.09 | 2.42 | NO |
| Lead | 0.951 | 0.951 | 3.000 | 210.00 | 8.10 | 3.16 | 3.06 | NO |
| Silver | 0.850 | | | 1.90 | 100.00 | 0.07 | 0.03 | NO |
| Zinc | 0.946 | 0.946 | 19.000 | 90.00 | 81.00 | 25.98 | 21.69 | NO |

| Effluent percentile value | | Max effluent conc. measured (metals as total recoverable) | Coeff Variation | | # of samples | Multiplier | Acute Dil'n Factor | Chronic Dil'n Factor | |
|---------------------------|-------|---|-----------------|------|--------------|------------|--------------------|----------------------|--------------------------------|
| | Pn | ug/L | CV | s | n | | | | COMMENTS |
| 0.95 | 0.966 | 29350.00 | 0.12 | 0.12 | 86 | 1.00 | 12.0 | 31.1 | For 40% Of 2020 flow (6.6 mgd) |
| 0.95 | 0.473 | 4.00 | 0.60 | 0.55 | 4 | 2.59 | 12.0 | 31.1 | Wet season only |
| 0.95 | 0.473 | 7.00 | 0.60 | 0.55 | 4 | 2.59 | 12.0 | 31.1 | |
| 0.95 | 0.473 | 2.00 | 0.60 | 0.55 | 4 | 2.59 | 12.0 | 31.1 | |
| 0.95 | 0.473 | 0.40 | 0.60 | 0.55 | 4 | 2.59 | 12.0 | 31.1 | |
| 0.95 | 0.473 | 42.00 | 0.60 | 0.55 | 4 | 2.59 | 12.0 | 31.1 | |

EFFLUENT AMMONIA DATA

| DATE | AMMONIA (mg/L) |
|------------|-------------------|
| 1/07/2003 | 29.2 |
| 1/14/2003 | 28.9 |
| 1/21/2003 | 28.2 |
| 1/28/2003 | 27.9 |
| 2/05/2003 | 28.9 |
| 2/12/2003 | 28.2 |
| 2/19/2003 | 28 |
| 2/26/2003 | 28.6 |
| 3/05/2003 | 28.1 |
| 3/12/2003 | 28.7 |
| 3/19/2003 | 28.7 |
| 3/26/2003 | 29.6 |
| 4/02/2003 | 28.2 |
| 4/09/2003 | 29.6 |
| 4/16/2003 | 27.3 |
| 4/23/2003 | 24.3 |
| 4/30/2003 | 22.9 |
| 5/07/2003 | 25.4 |
| 5/14/2003 | 27.9 |
| 5/27/2003 | 27.2 |
| 6/11/2003 | 31.6 |
| 6/18/2003 | 24.9 |
| 6/25/2003 | 29.2 |
| 11/04/2003 | 25.6 |
| 11/12/2003 | 26.6 |
| 11/18/2003 | 27.1 |
| 11/25/2003 | 25.1 |
| 12/02/2003 | 27.5 |
| 12/09/2003 | 26.5 |
| 12/16/2003 | 26.4 |
| 12/23/2003 | 28.3 |
| 12/30/2003 | 25.4 |
| 1/06/2004 | 26.8 |
| 1/13/2004 | 27.3 |
| 1/20/2004 | 25.4 |
| 1/28/2004 | 26.5 |
| 2/04/2004 | 24.8 |
| 2/11/2004 | 23.6 |
| 2/18/2004 | 11.7 |
| 2/25/2004 | 22.1 |
| 3/03/2004 | 21.5 |
| 3/10/2004 | 21.4 |
| 3/17/2004 | 19.6 |
| 3/24/2004 | 22.3 |
| 3/31/2004 | 24.4 |

| | |
|------------|------|
| 4/07/2004 | 25.7 |
| 4/14/2004 | 27.7 |
| 4/21/2004 | 29.2 |
| 4/28/2004 | 29.1 |
| 5/05/2004 | 27.4 |
| 5/12/2004 | 26.2 |
| 5/19/2004 | 29.4 |
| 5/26/2004 | 28 |
| 6/08/2004 | 20.6 |
| 6/15/2004 | 13.5 |
| 6/22/2004 | 24.6 |
| 11/04/2004 | 25.1 |
| 11/10/2004 | 26.8 |
| 11/17/2004 | 28.3 |
| 11/24/2004 | 28.8 |
| 12/01/2004 | 28.6 |
| 12/08/2004 | 29.9 |
| 12/15/2004 | 26.7 |
| 12/22/2004 | 25.5 |
| 12/29/2004 | 25.1 |
| 1/04/2005 | 26.6 |
| 1/11/2005 | 25.5 |
| 1/18/2005 | 24.7 |
| 1/25/2005 | 27 |
| 2/02/2005 | 25.4 |
| 2/09/2005 | 26.2 |
| 2/16/2005 | 25 |
| 2/23/2005 | 24.3 |
| 3/02/2005 | 25.6 |
| 3/09/2005 | 24.8 |
| 3/16/2005 | 26.4 |
| 3/23/2005 | 26.7 |
| 3/30/2005 | 27.5 |
| 4/06/2005 | 27.6 |
| 4/13/2005 | 27.1 |
| 4/20/2005 | 26.6 |
| 4/27/2005 | 27.8 |
| 5/04/2005 | 27.2 |
| 5/11/2005 | 26.6 |
| 5/18/2005 | 25.5 |
| 5/25/2005 | 26 |

AMMONIA DATA STATISTICS

| <i>Ammonia 2003-2005</i> | |
|--------------------------|--------------|
| Mean | 26.20581395 |
| Standard Error | 0.327972483 |
| Median | 26.65 |
| Mode | 25.4 |
| Standard Deviation | 3.041491687 |
| Sample Variance | 9.250671683 |
| Kurtosis | 8.27763489 |
| Skewness | -2.302510643 |
| Range | 19.9 |
| Minimum | 11.7 |
| Maximum | 31.6 |
| Sum | 2253.7 |
| Count | 86 |
| | |
| CV = | 0.116061714 |
| | |
| 95th percentile | 29.35 |